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(71) Applicant (for all designated States except US): CEREOL
NÖVÉNYOLAJIPARI RT. [HU/HU]; Rumbach S. u.
19-21, H-1075 Budapest (HU).

(72) Inventors; and

(75) Inventors/Applicants (for US only): CZUPPON, Tibor
[HU/HU]; Róna u. 154 IV/2, H-1145 Budapest (HU).

KEMÉNY, Zsolt [HU/HU]; Irisz u. 10, H-1237 Budapest
(HU). KÖVÁRI, Endréné [HU/HU]; Pejko u. 29, H-1162
Budapest (HU). RECSEG, Katalin [HU/HU]; Zrínyi u.
10/B, H-1188 Budapest (HU).

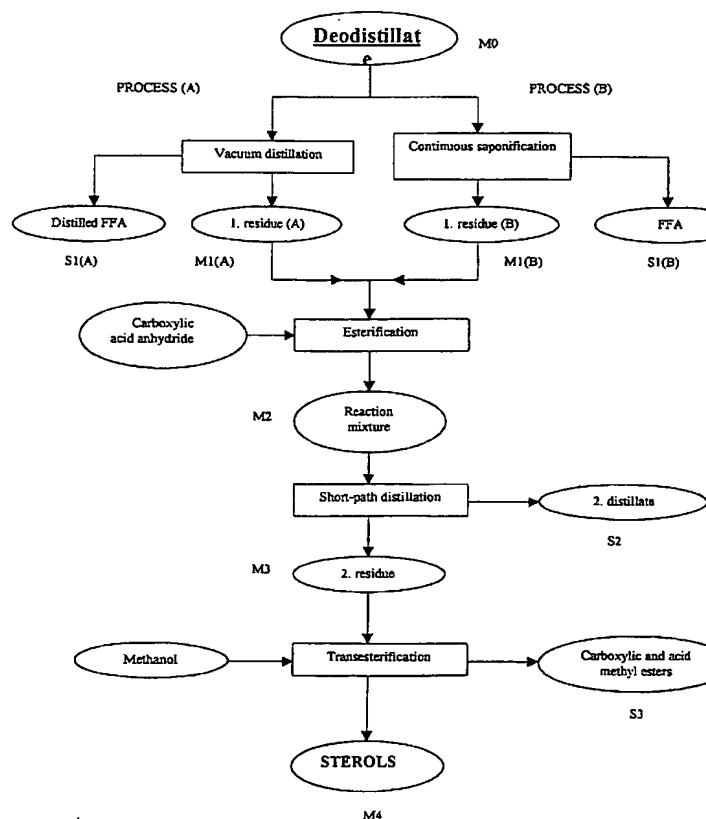
(74) Agent: ADVOPATENT OFFICE OF PATENT AND
TRADEMARK ATTORNEYS; P.O. Box 11, H-1251
Budapest (HU).

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(54) Title: PROCESS FOR RECOVERY OF PLANT STEROLS FROM BY-PRODUCT OF VEGETABLE OIL REFINING



(57) Abstract: The process for recovery of plant sterols and tocopherols from deodorization distillates formed during chemical or physical refining of vegetable oils consists of the following steps: free fatty acids are removed from the deodorization distillate by vacuum distillation or by continuation solvent saponification, after the removal of free fatty acids, the received material is reacted with an aromatic carboxylic acid anhydride at a temperature of 50-150° C, under reduced pressure, after the treatment with anhydride, tocopherols are removed from the mixture, and crystalline free sterols are recovered from the distillation residue containing sterol esters, di- and triglycerides by transesterification.

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ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK,
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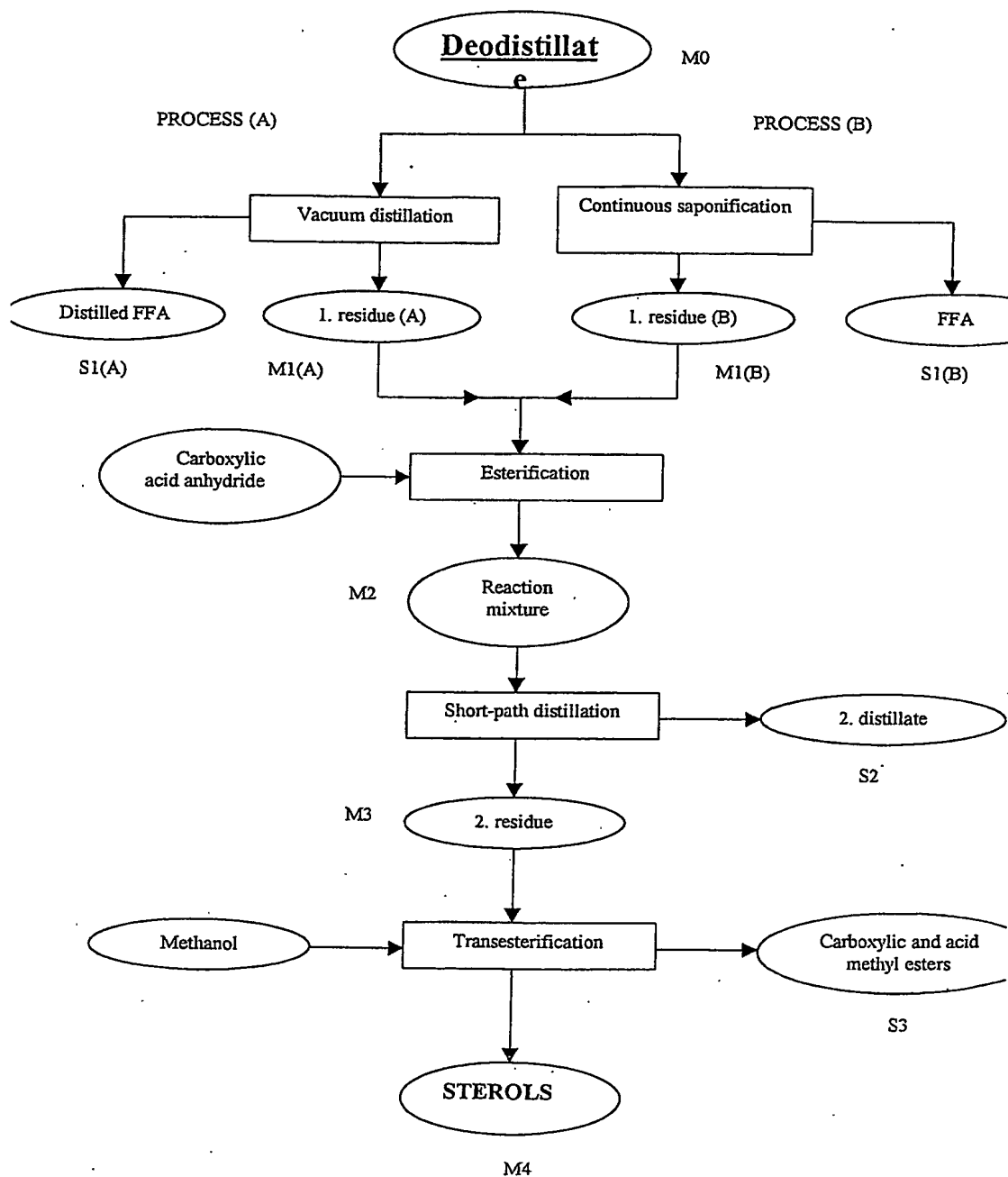


Figure 1

INTERNATIONAL SEARCH REPORT

International Application No

PC 02/00062

A. CLASSIFICATION OF SUBJECT MATTER
 IPC 7 C11B3/00 C11B7/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
 IPC 7 C11B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5 512 691 A (BARNICKI SCOTT D ET AL) 30 April 1996 (1996-04-30) cited in the application the whole document ---	1-9
A	US 5 424 457 A (SUMNER JR CHARLES E ET AL) 13 June 1995 (1995-06-13) the whole document ---	1-9
A	US 3 153 055 A (SMITH FRANK E ET AL) 13 October 1964 (1964-10-13) the whole document ---	1-9
A	US 5 703 252 A (SCHWARZER JOERG ET AL) 30 December 1997 (1997-12-30) the whole document -----	1-9



Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

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"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

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Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
 NL - 2280 HV Rijswijk
 Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
 Fax: (+31-70) 340-3016

Authorized officer

Fritz, M

INTERNATIONAL SEARCH REPORT

International application No.
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Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-9

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

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